

## Main Principles and Results of Landscape Planning of New Protected Area in Central Caucasus (Georgia)

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### Keywords

Protected area, Landscape, Landscape Area, Geoecological Processes, Function of Landscapes, Environment.

### Actuality of the problem

The Central Caucasus is a part of the mountainous Caucasus ecosystems between Russia and Georgia. This territory with the face of medium and high mountain forests, meadows, subnival ecosystems represents **one of the key** and trans-border cooperation area in the Caucasus eco-region. Here, the main aim of landscape planning was the formation of new protected areas. Planned, protected areas cover the two historical-geographical provinces of Pshavi and Khevsureti.

A special importance of Pshav-Khevsureti is connected with the **unic ethnocultural and natural** diversity in the Caucasus, its transitional location among other protected areas of the Central Caucasus (Tusheti, Kazbegi and North Caucasus), international environmental cooperation, ecological agriculture and the main area of tourism development.

Planning territory is represented by **several landscape units**, which are characterized by well-defined vertical zonation. The same are the forms for agricultural use of the territory, which is based on several millennia of experience.

Pshav-Khevsureti is poor with the land resources suitable for farming, however, rich with suitable mowing livestock-pasture. The region is known for its great tradition of using medicinal plants, what increases its interest at international level. Despite the moderate cold climate, Pshav-Khevsureti actively developed in many areas of agriculture. Agricultural activity mostly was carrying extensive character, what grew anthropogenic load and **transformation scales** for different ecosystems of the mountain.

As a result of such activity, the upper border of the forest landscape have been lowered, increased fragmentation of relief, suffered degradation of pasture species diversity, Subalpine forests destroyed, also many species of flora and fauna and other.

Currently, natural ecosystems of Pshav-Khevsureti in need of protection, (maintenance), improvement, and ecologically sustainable development, what preferably be carried out on the bases of the principles of landscape planning and by organizing protected area systems.

Currently, the main aim of landscape planning is preservation, development and improvement the **natural environment** of Pshav-Khevsureti, with respect of economic and social interests of the local population in sustainable development. Achieving such a goal is possible as through the creation of protected areas, so with the ecologically oriented planning for existing land usage. Territorial planning is essential for the promotion of geographical, ecological and cultural values that can become a solid foundation for the recreational farming.

It should be noted that in the vicinity of Pshav-Khevsureti planning areas are already **functioning** Tusheti Protected Areas and Kazbegi Nature Reserve, is being planned Kazbegi National Park. Creation of Pshav-Khevsureti's new protected territories and connection through ecological corridors with the existing, is a prerequisite for proper successful regional and cross-border cooperation.

### Geographical and environmental characteristics of the Planning Area

Vertical extension of planning area reaches 3500m. It is characterized by complex orography. The main orographic units are the main Caucasian watershed and side ridge. Here, a number of passes are represented, what are important objects for planning such tourist routes as (Hiking, Horseback).

The planning areas main orographic units are distinguished with high slope inclination (30-35°) and typical alpine toothed rocky terrain. From the mesoforms of relief, in nival and subnival zones mainly are developed cirques of old glacier origin, doors, U-shaped short valleys and the morain hills located at their foot. In the middle and high mountains of planning areas dominate erosion forms of rivers and mountain-valley that are mainly represented by the gorges similar to the 5<sup>th</sup> century and their watersheds slopes. In some of the high mountains, an important role plays ancient forms of glacier relief.

On the main Caucasian watershed ridge, glaciers were landing in all direction on the time of late Pleistocene. During the last half -century the glaciers were about 500meters step away.

Geodynamical processes are related as well as to endogenic (seismic activity) and egzogenic (depletion, denudation) action, so to the human economic activity. They are well characterized by well defined geographical (vertical) features and almost all forms of geodynamical processes-starting with nival-glacier and ending by erosion, denudation and accumulation processes.

Erosion processes caused significant damage to the region's population and infrastructure. Here are many mud stream ravines, what pose a threat to the local community as well as the roads, and to the normal functioning of tourist routs.

From the majority of planning area rivers are typical high mountain rivers, for which the nesessary important factor for a large energy potencial is charecterized- a big drop in unit length, which deacreses towards river confluence. Great river energy of planning region creates a real base for the development of a low-power hydro electric power stations, what in conditions of mountainous and forested landscape is one of the most effective event from the point of economic, social, and enviromental view. Resource potential of rivers is significantly associated with the spread of forest, what promotes atmospheric precipitations gradually leaching and groundwater formation.

Due to the severe wheather and natural conditions and the lack of forest resourses among population was formed tradition of using caution towards economic usage of the forests:forests were not cut and defended near the populated and avalanche dangerouse places.

Wood was used as fuel, medium and small assortment of economic activity. Dwelling houses and industrial buildings here mainly are built of the stone and the wood used in relatively small quantities. The wood is used by shepards for pasturing agricultural activities and as fuel.

It is noteworthy that in Georgia from of 5 birch species, only 3 species are growing:(Betula Verrucosa), (Betula Litwinowii) and (Betulla Raddeana). The latter is the endemic, the relic and is included in the Red List of Georgia. The local birches charecteristic feature is that they often create straight trunk tree stands instead of crooked. It should be noted that here is compactly presented a high mountain forests of oak with relatively large fragments.

Here, is also the last border of spreading to the Eastern direction on the Main Caucasus for (Picea orientalis)Eastern Spruce. The dominant species in the forest are distingushed, Oriental Beech (Fagus orientalis), Hornbeam, Asp, represented by groups and units Maple, Ash, Elderberry, Nuts and more.

## **The basic principles for selection the planning areas**

The selection of planning area is based on several principles, which is related to the creation of a network of protected areas and actual cross-border cooperation, the landscape diversity and uniqueness, ethno-cultural, socio-economic and environmental situation of the planning area.

### The principle for actuality

Planning area represents one of the socio-economic most undeveloped regions that need to change already existing economic profile. Here, a number of demographic indicators substantially changed during last dacades- we face a demographic crises in full, which may lead to depopulation. In the effective implementation of Demographic and Economic Policy, an important role may play a new inviromental strategy, which related to the formation of a network of protected areas, alternative and safe energy sources, ecological agriculture and tourism development.

On the planning area and Caucasus ecoregion is developing cross-border environmental cooperation. It is useful for the current political processes of the Caucasus region. It is also important that with the aim of developing environmental cooperation and for the formation of protected areas, is actively working as the Georgian government so many of the local non-governmental and international environmental organizations.

International environmental organizations (The European Landscape Convention, WWF, GZT, TJS and others) are active in the formation of a network of protected areas, in order to protect high mountain ecosystems, what in Georgia is one of the most important prerequisites for developing the European values, The European Enviromental Law and principles and for the Caucasus countries' integration into the European.

The formation of protected areas (national park, reserve, protected landscape, nature monument and other) in the Caucasus is based on the European experience and methodology, what in the region is the basis for further development and testing.

### The unic principle

Planning protected areas are represented by high mountain ecosystems, which may be discussed together with the live wildelife species and ethnocultural diversity as the distinctive and unic space for Europe.

It should be noted that the planning area is presented with not a single important historical object and nature monument, which have a great importance in identification of the world's mountainous territories and for peculiarity analysis development.

### The principle of Socio-economic tensions

Extensive agriculture has developed mainly in protected planning area, in particular the livestock. Farm is practically deprived of food industry enterprises, what is an obstacle to its development. Virtually, no

consideration of the requirements of the international markets for ecologically clean food production, the potential of which is quite large.

The vast majority of regional population was resettled in lowland areas in different years. Migration process is still underway, which contributes to the low level of household infrastructure and of industrial development. People actually don't possess alternative energy equipment makers (The sun, wind, geothermal, biogas) and not familiar with these methods. In case of their usage, will be improved not only economic but also ecological situation.

Tourism is slightly developed on planning area, what is strongly connected to the lack of its strategy and traditions. It is also noted by the population that tourists' stream is decreasing annually, what is associated with lack of information and a low level of the development of appropriate infrastructure.

Through landscape design can be created a system of protected areas based on the principles of sustainable development. Its popularity and international recognition will provide many types of tourism development, especially, its ecological, historical-ethnographical, cognitive-educational, nutrition and other areas.

#### The principle of ecological tension

Ecological tension in the region is related to three factors: natural, anthropogenic and legal conflicts. **Natural Conflicts** - linked to by water erosion on the branches of Central Caucasus, high rates of physical exhaustion and separate geodynamic processes, continental climate (intensive physical exhaustion), high seasonal temperature amplitude and duration of snow cover (5-6 months).

**Anthropogenic Conflicts**-associated with the large scale utilization of a territory, in particular the development of livestock farming in the mountains. Beside the local population, the territory historically and actively used for summer pasture by large numbers of sheep brought from other areas, what increasing anthropogenic load and high mountains (subalpine) ecosystems mass destruction. Population indicates on the growth of prey animals numbers, however the poaching is intensive. As a result of anthropogenic impact, planning area diversity is significantly depleted, restoration of which should be facilitate by the formation and regime of the protected areas.

**Legal Conflicts**-are mainly related to the substantial disregard of the Georgian and International Environmental Laws. From the point of Georgian Legislation should be mentioned the Georgian Law about „Environmental Protection”, „Water”, „Soils”, „The Red List”, „The Red Book”, „Animal World”, „Tourism and Resorts”, The Sea, Reservoirs, Regulation and Engineering Protection of River Banks”, „Cultural Heritage and other.

### **Landscape Planning Methodology**

Landscape planning follows standardised procedures which normally consist of five interconnected and interdependent stages:

- 1 **Inventory.** Gathering and summarising all available geographic information about the area's natural environment, its socio-economic conditions, and identifying major conflicts related to the population – nature use system;
- 2 **Assessmen.** Assessing the natural conditions and potential of the planning territory in terms of the categories of significance and sensitivity, also assessing land use patterns and trends;
- 3 **Development of goals** for setting a concept of planning area component management;
- 4 **Integration of objectives.** Setting an integrated goal-orientated concept of spatial management.

### **Results**

The **key factors** of establishment of the Javakheti protected areas are:

- The transboundary position between Georgia, Armenia (the length of the planning area boundary is 45.3 km) and Turkey (the length of the planning area boundary is 43.2 km) that may lay the foundation of sustainable ecological cooperation in the Caucasus ecoregion;
- Biological and landscape diversity (volcanic terrain, canyons, volcanogenic lakes, mountain steppes, subalpine tall grasses, wetlands, routes of migratory birds, etc.);
- High recreational value (unique natural and cultural heritage sites);
- Environmental problems (biodiversity degradation, eutrophication and anthropogenic regulation of volcanogenic lakes, a need for conservation of planted forests, intensive impact on fauna species, intensive wind erosion and exhaustion, introduction of alien ichthyofauna species, overgrazing);
- Legal conflicts;
- Landscape value;
- Establishment of integrated PA system;
- Sustainable socioeconomic development of the region.

**Landscape planning structure** may be composed of key natural, recreational and economic components. It also can involve components that can be classified by their economic, natural, recreational and ecological value, by intensity of their influence on natural and social environment, and by their location (distance from the centre or radius).

PA category, value (ecological, recreational), natural anthropogenic and legal conflicts, also sectoral or complex area development goals make up the set of documents that form the **PA landscape planning basis**. PA

development and management **goals**, involving conservation, improvement and development, are determined considering landscape functions.

The environmental, restorative and recreational functions of the landscape in the Javakheti planning area allow establishing two national parks, five sanctuaries, two protected landscapes and one natural monument. Their immediate proximity is an important condition of development of different trends of tourism and economy.

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